REMARKS

(A) STATUS OF THE APPLICATION

Applicants wish to thank the Examiner for his clear explanation of the rejections in the Final Office Action dated August 08, 2006.

(I) DISPOSITION OF CLAIMS

(i) Claims 2 and 7 are pending in the application.

(ii) Claims 2 and 7 have been rejected under 35 U.S.C. § 103 (a).

(iii) Claim 1, 3-6, and 8-13 have been previously canceled.

(II) APPLICANTS' ACTION

(i) Applicants respond to the rejection of Claims 2 and 7.

(ii) Applicants respond to a rejection based on nonstatutory, obviousness-type double patenting.

(iii) Applicants respond to a provisional rejection based on nonstatutory, obviousness-type double patenting.

(B) REJECTION UNDER 35 U.S.C. § 103(A)

CLAIMS 2 & 7: JP-4-130190 TO KAORU, *ET AL.* IN VIEW OF U. S. PATENT NO. 3,014,832 TO DONNELLY

Claim 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent JP-4-130190 to Kaoru, *et al.* (*hereinafter* "Kaoru"), in view of U.S. Patent 3,014,832 to Donnelly (*hereinafter* "Donnelly").

Examiner's Arguments

The Examiner states that Kaoru discloses a method of cleaning a surface of a papermaking rotating dryer drum wherein a release agent, an emulsified silicone oil solution, is applied to the surface of the drum by direct spraying onto the surface. In Example 3, Kaoru discloses continuous spraying at a rate of 2.0 L/min onto a surface of a Yankee drum dryer, the dryer having a width of 3 m, without staining the paper strip by the release of the oil. However, Kaoru fails to disclose the drying cylinder linear rotation speed, data that would permit to calculate the spray rate in the units claimed i.e., $(mg)/(min)(m^2)$.

However, Donnelly discloses a process wherein a dryer surface is kept clean by the release spraying of silicone containing emulsified oil onto the surface of the drum. Furthermore, Donnelly discloses drying cylinder drum rotation up to 3000 ft/min. Thus, according to the Examiner, if one were to utilize the Donnelly dryer rotation speed of 3000 ft/min, the Kaoru method of cleaning calculates to a spray rate of about 0.72 (**mg**)/(m^2)/(min). (*emphasis added*). It would have been obvious to one skilled in the art to combine the teachings of Kaoru and Donnelly, because such a combination would improve the control of adhesion of the web to the dryer surface thus improving the quality of the Kaoru product, as disclosed by Donnelly. Kaoru discloses a surfactant added to the silicone oil and water addition is disclosed by Donnelly. Thus, it would have been obvious, to one skilled in the art at the time the invention was made, to dilute the oil with heated water, since the cylinder drum of Donnelly operates at elevated temperatures.

Applicants' Response

Applicants respectfully disagree with the Examiner's reasoning of obviousness under 35 U.S.C. § 103(a) with reference to Kaoru in view of Donnelly. Section 2142 of the MPEP indicates that a *prima facie* case of obviousness is established only when:

(1) all of the claim limitations are either taught, or suggested by the cited prior art;

(2) there is some suggestion or motivation to modify or combine the cited prior art references; AND

(3) there is a reasonable expectation of successfully producing the claimed invention via such a combination.

Section 2143 of the MPEP further explains that "[t]he teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not in applicant's disclosure."

Applicants respectfully assert that because neither of the three prongs set forth in the above test are satisfied by the Examiner's proposed combination of the two references, a *prima facie* case of obviousness is not established.

First Prong

Applicants respectfully disagree that Kaoru in view of Donnelly discloses all elements of the present invention. Neither Donnelly nor Kaoru disclose or suggest the amount of oil supplied to the surface of the drum dryer as described in the

present invention. Kaoru discloses the width of the drum dryer to be 2m, 3m and 4m (corresponding to Examples 1, 2 and 3, and 4, respectively). However, parameters such as the rotating speed or surface speed of the drum dryer or the paper speed are not disclosed. Thus, the spray rate per minute and per area of Kaoru are not described. Therefore, because Kaoru cannot specify the spray rate in accordance with that provided by the present invention ((mg)/(m^2)(min)) and because Donnelly does not provide spray rates for application of the release agent directly to the surface of the drum dryer, the combination of references does not teach or suggest all of the claim limitations.

In addition, the Examiner quotes a drum rotation speed of 3000 ft/min (equivalent to about 915 m/min) from Donnelly, as a basis to calculate the spray rate to be incorporated in Example 3 of Kaoru. The Examiner arrives at a number 0.72 (mg)/(m^2)(min) for the spray rate per unit area by using the parameters of Example 3 in Kaoru. We respectfully submit that the Examiner is in error in his calculation of the spray rate as used in Example 3. Calculations from Example 3 are provided below for clarification purposes:

Spray rate in Kaoru = 2.0 (L)/(min)
= 2,000 $(cm)^3$/(min)

Therefore, for a specific gravity of 1 (g) /$(cm)^3$,
Spray rate = **2,000 (g)/(min)** **(A)**

For a 3 m wide drum, at a drum rotation of 3,000 (ft)/(min),
Exposed Area of the drum = Width in m X Drum Speed in (ft)/(min) units
in one minute X No of meter per unit foot
= 3 (m) X 3,000(ft)/(min) X 0.3048 (m)/(ft)
= **2,745 $(m)^2$** **(B)**

Therefore,
Spray Rate/Unit Area
at the Drum Rotation
Speed of 915 (m)/(min) = **(A)/(B)**
= [2,000 (g)/(min)]/2,745 $(m)^2$
= 0.728 (g)/$(m)^2$(min)
= **<u>728 (mg)/$(m)^2$(min)</u>**

Applicants respectfully submit that the Examiner has erred in assuming the spray rate per unit area ***in terms of (mg) instead of (g), and therefore, has cited a spray rate of 0.72 (mg)/(m^2)(min), as provided by Kaoru in light of Donnelly, which according to him delivers the spray rate within the claimed range of the present invention***. Clearly, the correct spray rate, i.e., the rate of 728 (mg)/(m)^2(min), is outside any suggested spray rates by the claimed invention by a wide margin. For completeness, and to add weight to our argument, Applicants have provided calculations for each of the drum widths used in the Kaoru Examples. It is clear that calculations for all Kaoru Examples at a drum rotation speed of even as high as 3000 ft/min show a spray rate per unit area distinctly higher than the presently claimed spray rate of 0.1 to 200 (mg)/(m^2)(min). Please see the Table below:

KAORU EXAMPLE NO.	DRUM WIDTH (M)	CALCULATED SPRAY RATE PER UNIT AREA, IN (MG)/(M)^2(MIN) AT A DRUM ROTATION SPEED OF 3000 FT/MIN
1.	2	546
2.	3	544
3.	3	728
4.	4	819

Therefore, Applicants respectfully submit that all claim limitations are not taught or suggested by the combination of Kaoru and Donnelly.

Deriving any other drum rotation speed from Donnelly would be akin to hindsight reconstruction because "[t]he teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not in applicant's disclosure."[1]

Here, the maximum drum rotation speed that Donnelly teaches is 3000 (ft)/(min). In fact, in Examples (I), (II), and (III), Donnelly teaches even lower drum rotation speeds of 2300 (ft)/(min), 1600 (ft)/(min), and 2400 (ft)/(min). Clearly, for lower rotation speeds, the spray rate, using the parameters of Example 3 of Kaoru, would be even higher than that at 3000 (ft)/(min). In fact, in particular, the spray

[1] *In re Vaeck*, 947 F.2d 488, (Fed. Cir. 1991).

rates at the three rotation speeds 2300 (ft)/(min), 1600 (ft)/(min), and 2400 (ft)/(min) would correspond to 950 (mg)/(m)^2(min), 1365 (mg)/(m)^2(min) and 910 (mg)/(m)^2(min), distinctly outside and remote to the range recommended and claimed in the present invention, of 0.1 to 200 (mg)/(m)^2(min).

Similarly, for Examples 1, 2 and 4 of Kaoru, the spray rates for rotation speeds of 1600 (ft)/(min), 2300 (ft)/(min) and 2400 (ft)/(min) (specifically enumerated in Donnelly) will be higher than that for a rotation speed of 3000 (ft)/(min). Secondly, Kaoru, in view of Donnelly, or at every drum rotation speed taught in Donnelly, will provide a worse performance compared to the presently claimed invention. Applicants respectfully submit that Kaoru in view of Donnelly does not teach all the claim limitations of the present invention.

Therefore, even if the Kaoru and Donnelly were combinable (which they are not), all claim limitations are not taught in the combined references.

In conclusion, the first prong of the obviousness inquiry is not satisfied.

Second Prong

With respect to the combining of references, Section 2143.01 of the MPEP indicates that, in accordance with the Federal Circuit's decision in *In re* Mills, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination."[2] There is no motivation or suggestion in Kaoru or Donnelly to combine the two references in order to arrive at Applicants' invention.

In conclusion, the second prong of obviousness inquiry is not satisfied.

Third Prong

Not only that there is no motivation or suggestion to combine Donnelly and Kaoru but there is not also a reasonable expectation of successfully producing the claimed invention via the combination of references. In fact, based on the teachings of Donnelly, and as shown from the calculations above, a combination would result in spray rates clearly outside the claimed ranges.

Moreover, as described in the present patent application, a spray rate above about 500 (mg)/(m)^2(min) would result in dripping of the surface treatment agent.

[2] *In re Mills*, 916 F.2d 680, (Fed. Cir. 1990).

Such dripping is not desired because it would cause oil stains on the paper being processed and also contaminate the peripheral equipment. (See Page 7 of Specification). Therefore, in fact, a combination of Kaoru and Donnelly as asserted by the Examiner teaches away from the present invention, *inter alia*, with respect to the spray rates.

In conclusion, the third prong of the obviousness inquiry is not satisfied.

Other Differences

It should also be noted that the present invention relates to a method of preventing contamination of a canvas and does not relate to a method of preventing contamination of a drum dryer as disclosed in the cited references. That is, the present invention does not apply a silicone oil to a metallic drum dryer, but it is a method of preventing contamination by applying a silicone oil to the canvas formed of woven fabric, felt, or knitted fabric.

Second, because, this invention relates to a process for preventing contamination of the canvas, the silicone oil is specifically sprayed onto the canvas, and as a result, the silicone oil is transferred to that surface of the canvas that is facing the paper strip, but is not transferred to the opposite surface of the paper strip, i.e., the surface of the drum dryer facing the paper strip. It should be noted that the canvas of the present invention does not directly contact with the drum dryer. Accordingly, in the present invention, the silicone oil is not applied directly onto the drum dryer.

Third, because the drum dryer is directly heated, the foreign particulate matter originating from the paper strip end up adhering to the drum dryer mainly as a result of burning or charring of the foreign particulate matter. On the other hand, in the present invention, the canvas is not heated. Thus, any foreign particulate matter originating from the paper strip ends up adhering to the canvas not because of burning or charring, but because of pressure. Accordingly, because the foreign matter off the paper strip that adheres to the drum dryer is different physically and chemically from that adhering to the canvas, the application of silicone oil to the canvas is different.

Fourth, according to the present invention, the silicone oil is continuously supplied at a spray rate of 0.1 to 200 mg/m^2-min to the surface of the canvas generally formed of woven fabric, felt or knitted fabric, thereby achieving the effect of

preventing various foreign matters contained in the paper strip from being adhered to the surface of the canvas. On the other hand, the drum dryer is made of metallic, hard material.

In addition, according to the present invention, the clogging of the canvas caused by dripping of the surface-treatment agent is restrained by adjusting the amount of supply of the silicone oil and by spraying the silicone oil onto the canvas, thereby reliably achieving the prevention of contamination of the canvas.

The cited references, either alone or in combination, do not render Claims 2 or 7 obvious under 35 U.S.C. § 103(a). Applicants believe that a *prima facie* case of obviousness is therefore not established. It is respectfully requested that these rejections be withdrawn in light of the above arguments.

(C) REJECTION-NONSTATUTORY, OBVIOUSNESS-TYPE DOUBLE PATENTING CLAIMS 2 & 7: U. S. PAT NO. 6,858,113 TO SEKIYA

Claims 2 and 7 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,858,113 to Sekiya (*hereinafter* "Sekiya"). Applicants contend that the cited reference does not make the current invention obvious under 35 U.S.C. § 103(a) and therefore respectfully request that these rejections be withdrawn.

Sekiya is directed to a method of ***preventing contamination of the surface of a dryer drum*** in a papermaking machine and specifically claims the use "of a surface forming agent which contains synthetic resin ***powders*** as the main constituent thereof" (See Col. 11-12, Claim 1). In contrast, the current application is directed to a method of ***imparting anti-contaminant properties upon the canvas*** of the papermaking machine through the use of a ***silicone oil*** spray treatment (See Page 4, Lines 13-16; Page 1:31-33, Page 2, Lines 30-34). Thus, the current invention differs from Sekiya in several fundamental respects.

First, Sekiya is intended to treat the inflexible metal dryer drum surface (See Col. 4 Lines 30-32; Cols. 11-12 and Claims 1-7; Col. 1 Lines 29-30) while the current invention is intended to treat the flexible, fibrous, and porous canvas surface (See Page 1, Lines 31-33, Page 2, Lines 30-34). As stated above, this difference results in great dissimilarities in the manner in which these two inventions are practiced and

the challenges that arise in making these two inventions operable. For example, the current invention must be operated in a manner such that a sufficient volume of spray is applied to the canvas to impart anti-contaminant properties (See Page 12, Lines 20-27) but not an excessive amount so as to clog the eyes of the canvas, thereby reducing the ability of the canvas to pass moisture through it (See Page 4, Lines 17-21; Page 4, Lines 3-5). However, because the dryer drum treated in Sekiya is not a flexible, fibrous, and porous surface that absorbs and retains liquids, no such issue exists in practicing the Sekiya patent. Because of challenges such as this, which do not exist for Sekiya, it would clearly not be obvious to use the invention disclosed Sekiya to supply an anti-contaminant coating to the canvas.

Second, Sekiya discloses and claims the use of a surface forming agent to fill up the "recesses in microscopic asperities on the surface" of the dryer drum with synthetic resin powder and further by forming a synthetic resin film layer on the dryer drum surface (See Col. 4 Lines 30-40). In contrast, the current application uses no such surface forming agent to fill in the spaces of the canvas and make it smooth. Instead, the current invention uses a silicone oil treatment to permeate the fibers of the canvas to impart upon it anti-contaminant properties (See Page 4, Lines 13-16, Page 1, Lines 31-11, Page 2, Lines 30-34). This in no way fills in the gaps in the canvas surface or gives the canvas surface a more smooth finish. In fact, the invention specifically discloses that the gaps in the canvas, called the "eyes", must not be filled in because the clogging would inhibit evaporation thereby making the invention inoperable (See Page 4, Lines 17-21, and Lines 3-5). This difference in the intended result of the inventions further shows the lack of obviousness of the current invention in view of the Sekiya reference.

Lastly, Sekiya discloses and claims the use of a surface forming agent that has, as its main constituent, a synthetic resin powder (Sekiya, Col. 11-12, Claim 1; Col. 12, Claim 7). The current invention discloses no such resin powder, but rather specifically claims the use of a silicone oil emulsified with a surfactant and diluted with preheated water as a spray treatment (see Claims 2 & 7). This is a fundamental difference as the predominantly silicone-oil spray from the current invention would almost certainly not be effective in the intended operation of the Sekiya patent, and conversely, Sekiya's predominantly synthetic resin powder spray would almost certainly not be effective in the intended operation of the current invention. This again makes the current invention nonobvious in view of the Sekiya reference.

In addition to the above reasons, Sekiya does not teach or even suggest its use to impart anti-contaminant properties upon the canvas, further showing the nonobviousness of the current invention in view of that reference.

For all of these reasons, Applicants contend that the current invention is not obvious under 35 U.S.C. § 103(a) in view of the Sekiya patent and therefore respectfully request that the obviousness-type double patenting rejection as to Patent No. 6,858,113 to Sekiya be withdrawn and the claims allowed.

(D) PROVISIONAL REJECTION-NONSTATUTORY, OBVIOUSNESS-TYPE DOUBLE PATENTING
CLAIMS 2 & 7: U. S. PATENT APPLICATION NO. 09/806.020 TO SEKIYA

Claims 2 and 7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of copending Patent Application No. 09/806,020 (*hereinafter* "Sekiya 020"). Applicants contend that the cited reference does not make the current invention obvious under 35 U.S.C. § 103(a), and therefore respectfully request that these rejections be withdrawn.

Sekiya 020 is directed to a method of ***preventing contamination of the surface of a dryer drum*** in a papermaking machine by spraying onto the dryer drum a surface treatment agent prepared by emulsifying oil with a surfactant (Sekiya 020: Claim 1). In contrast, the current application is directed to a method of ***imparting anti-contaminant properties upon the canvas*** of the papermaking machine through the use of a silicone oil spray treatment (4, 13-16; 1:31-33, 2:30-3:4). The current invention differs from Sekiya 020 in several fundamental respects.

First, the Sekiya 020 invention is intended to treat the inflexible metal dryer drum surface (See Page 1, Lines 24-26), while the current invention is intended to treat the flexible, fibrous, and porous canvas surface (Page 1, Lines 31-33, Page 2, Lines 30-34). As stated above, this difference results in great dissimilarities in the manner in which these two inventions are practiced and in the challenges that arise in making these two inventions operable. For example, the current invention must be operated in a manner such that a sufficient volume of spray is applied to the canvas to impart anti-contaminant properties (See Page 12, Lines 20-27) but not an excessive amount so as to clog the "eyes" of the canvas, thereby reducing the ability

of the canvas to pass moisture through it (See Page 4, Lines 17-21 and 3-5). However, because the dryer drum treated in Sekiya 020 is not a flexible, fibrous, and porous surface that absorbs and retains liquids, no such issue exists in practicing the Sekiya 020 invention. Because of challenges such as this, which do not exist for Sekiya 020, it would clearly not be obvious to use the invention disclosed in the '020 application to supply an anti-contaminant coating to the canvas.

Second, Sekiya 020 discloses and claims the spraying of a "surface forming agent" onto the drum, with such surface forming agent acting by filling up the "recesses in microscopic asperities on the surface" of the dryer drum with oil (Sekiya 020: Claim 1; Page 5, Lines 15-20). In contrast, the current application uses no such surface forming agent to fill in the spaces of the canvas and make it smooth, instead using a spray treatment to permeate the fibers of the canvas to impart upon it anti-contaminant properties (See Page 4, Lines 13-16, Page 1, Lines 1-11, Page 2, Lines 30-34). This treatment does not fill in the gaps in the canvas surface and give it a more smooth finish. In fact, the invention specifically discloses that the gaps in the canvas, called the "eyes," cannot be filled in or the invention becomes inoperable (See Page 4, Lines 17-21 and 3-5). This difference in the intended result of the inventions further shows the lack of obviousness of the current invention in view of Sekiya 020.

In addition to the above reasons, the Sekiya 020 does not teach or even suggest its use in imparting anti-contaminant properties to the canvas, further showing the nonobviousness of the current invention in view of that reference.

For all of these reasons, Applicants contend that the current invention is not obvious under 35 U.S.C. § 103(a) in view of Sekiya 020, and therefore respectfully request that the obviousness-type double patenting provisional rejection as to copending Application No. 09/806,020 be withdrawn and the claims allowed.

CONCLUSION

In view of the present amendment and the above remarks, Applicants respectfully submit that stated grounds of rejection have been properly traversed, accommodated, or rendered moot and that a complete response has been made to the Final Office Action dated August 08, 2006.

Therefore, Applicants believe that the application stands in condition for allowance with withdrawal of all grounds of rejection. A Notice of Allowance is respectfully solicited. If the Examiner has questions regarding the application or the contents of this response, the Examiner is invited to contact the undersigned at the number provided.

There are no fees due in accordance with this response. However, should a fee be due that is unaccounted for, please charge such fee to Deposit Account No. 501447.

Respectfully Submitted,

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